

31. Miocene Proboscida from Baluchistan. By C. FORSTER  
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[Received May 3, 1922 : Read May 23, 1922.]

(Plates I.-IV.\* and Text-figures 1-12.)

The present paper contains a description of some Proboscidian remains obtained during two expeditions to the Lower Miocene deposits of Dera Bugti in Baluchistan.

These fragments are of interest, as they throw some further light on the earliest known Indian Elephants which have been described partly as a variety of *Bunolophodon angustidens* † and partly as belonging to a genus, *Hemimastodon* ‡, not known elsewhere. There are also teeth and a fragment of a lower jaw of a small *Dinotherium*.

Schlesinger §, in his beautifully illustrated account of the Mastodons in the Natural History Museum of Vienna, has figured and described two forms of *B. angustidens*. The criteria for distinguishing these two varieties lie, according to him, in the structure of the molars, and his description seems to refer especially to the intermediate teeth as being the more commonly found remains. In both forms the ridges consist of a large round outer cusp on the outer side of the tooth, with a smaller cusp pressed against its inner border and with one or more additional cusps in the valleys which separate the ridges. On the inner side of the tooth the ridge is continued by two similar main cusps—a larger on the outer side of the tooth and a smaller on the median side, but without any accessory cusps in the valleys.

Of the two varieties, one, which Schlesinger calls var. *typica*, shows these cusps as round in section and rather separate from one another, the surface of wear of the cusps being circular and flat with the general surface of the tooth; the other, var. *sub-tapiroidea*, differs in having the cusps more elliptical in section and less separate from one another, the accessory columns are less developed, and the areas of wear are oval and their planes slope from the general level of the tooth. While making these distinctions, Schlesinger at the same time denies the validity of

\* For explanation of the Plates, see page 626.

† Lydekker, 'Palæontologia Indica,' ser. 10, vol. vii. pt. 4, pp. 23-25 (1884). I use this generic name after Schlesinger, with whose work the chief comparisons in this paper are made and without prejudice to other names. The British Museum uses the name *Tetrabelodon*. My friend Professor H. F. Osborn writes to me since this paper was set up in type that he prefers the name *Trilophodon*.

‡ Pilgrim, 'Palæontologia Indica,' n. s. vol. iv. pt. 2, p. 17 (1912).

§ Schlesinger, Mitt. Geol. Geselt. Wien, Bd. xi. p. 133 (1918).

Lydekker's variety *palœindica*, which was founded chiefly on a third lower molar and which he states is within the range of variation of var. *typica*. The specimens now to be described tend, if anything, to reverse Schlesinger's view and in part to confirm Lydekker's.

The material in the collection consists of two palates of *B. angustidens* of slightly different age, part of a lower jaw belonging to the older of the two palates, and some separate upper and lower molar and premolar teeth.

The younger of the two palates (text-fig. 1) has on each side the last premolar and first molar in moderate wear, and the second molar erupting and unused. In front are the broken roots of the third premolar. Beyond this point and behind the second molars the specimen ends. The fourth premolars are weathered, but show a square outline and four subequal cusps a little elongated in the transverse direction. There is a shelf in front and low talon behind, and there are no intermediate cusps. They are very similar in size and shape to a corresponding tooth figured by Schlesinger for *B. longirostre*. There is no sign of a successional tooth underneath, so that it is not likely that they are imperfect milk teeth.

The first molars are three-ridged, with a very small talon. The first two ridges are worn, the third as yet untouched. They agree more with those figured by Schlesinger as var. *subtapiroidea*\* than as var. *typica* †.

The second molars, again, agree best with the figures of *subtapiroidea* ‡, but here the cusps seem more separate from each other, a difference which may be more apparent than real, and due in large measure to the tooth being unworn; an internal accessory cusp on the third ridge is more prominent than his figures show.

The other palate is rather older in that the second molar is now in wear on the first two ridges. The specimen on its right side has an open socket, from which the third premolar has fallen out; the fourth premolar and first molar are well worn, the second is partly in wear, and the front ridge of the third is preserved in the alveolus. It is clear that this animal had two premolars and two molars in simultaneous wear, which is a longer time than Andrews§ suggests for this species. The present specimen appears to show that these four teeth remain until the third molar erupts, when it finally pushes the premolars and first molar forward and out. This is consonant with the view, supported by other reasons, that the stage of *angustidens* represented by these Indian forms is earlier than that of the more typical French forms from Sansan etc., and is possibly as early as any yet described.

The structure of the teeth in this second palate is essentially the same as in the other, except that in the second molars the

\* Schlesinger, Mitt. Geol. Gesell. Wien, Bd. xi. pl. iii. fig. 2.

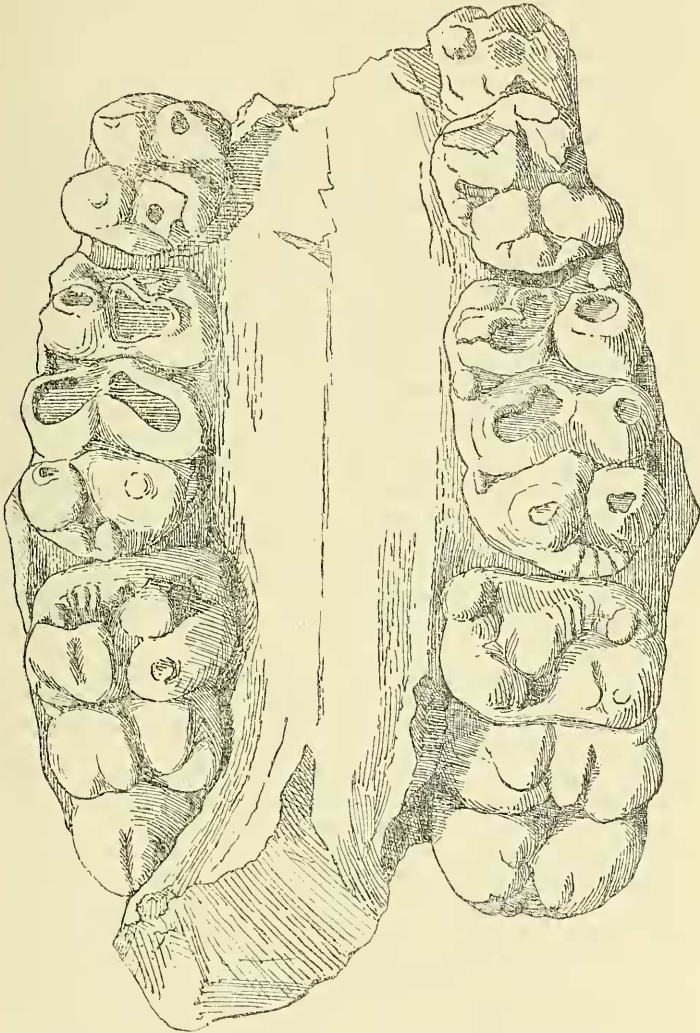
† *Loc. cit.* pl. ii. fig. 2.

‡ *Loc. cit.* pl. vii. fig. 3.

§ Andrews, Phil. Trans. R. S. vol. xciv. p. 108 (1903).

division of the various cusps in the ridges is less noticeable. This, again, is apparently due to wear; the grooves between the

Text-figure 1.



*Bumolophodon angustidens*. Palate with second molars just erupting.  $\times \frac{1}{2}$ .

cusps are often not more than shallow wrinkles in the thick enamel, and very little use would be sufficient to obliterate them.

In connection with these palates, the third upper molar (Pl. I. fig. 1) may be described, of which there are two separate specimens, a right and left, both unworn and of similar pattern. They differ in shape from corresponding teeth from France in the collection of the British Museum in being broad in front and in getting narrow behind so rapidly that the ground-plan of the tooth is that of an isosceles triangle instead of the more usual elongated form.

A tooth figured by Schlesinger\* (var. *subtapiroidea*) is apparently nearer the present one in shape, but, being tilted up in the figure, his specimen cannot be closely compared. In structure the two are very similar, except that in the Indian specimens the fourth ridge (talon) consists of three cusps only instead of four, and that anything in the nature of valley cusps is conspicuous by its absence. In Schlesinger's form the cusps of the main ridges are three on each side, except on the last ridge where they are double only; in the present form they are partly double, but here and there show either the treble condition or the beginning of it. In his form, however, there is a pair of accessory cusps which, while not very conspicuous, can be seen clearly in the first two valleys. These are absolutely unrepresented in the Indian form, with the sole exception of the first valley in one of the two teeth, which has a low but distinct cusp on the outer side connected to the posterior flank of the first ridge. It is possible that the "subtapiroid" condition is the more primitive, and small mutations in the direction of greater complication of the valleys are therefore to be expected.

These third upper molars, while nearly as broad as Schlesinger's specimen, are shorter, and are considerably more so than French specimens.

Another separate upper tooth, in quite unworn condition, is here figured (Pl. I. fig. 2). It is apparently a second molar of the left side, but is rather larger than the corresponding teeth in the two palates already described. It is similar to them in all respects, except that the arrangement of the cusps is much more that of the "*typica*" form. This is especially noticeable in those of the inner side and on the second ridge, where as many as eight cusps of different sizes can be counted. At first sight this tooth might be mistaken for a very small third molar on account of its rather pointed end, large talon, and absence of posterior pressure mark. If this were really so, it might have some bearing on Pilgrim's genus *Hemimastodon*. The pointed appearance is due to the thick enamel being broken away on each side, and is therefore purely artificial; if this part be restored, the tooth has the square end of a second molar. The large talon is due to the tooth being in germ and becomes resorbed when the third molar begins to press against it; in each of the two palates in which the third molar is not yet in contact with the second the latter has a large talon.

\* Schlesinger, *loc. cit.* pl. vii. fig. 3.



Of upper premolars there are two specimens, both unworn. One, apparently a third premolar of the left side, consists of four cusps arranged in pairs, but not joined into ridges, and a small talon. This is a small tooth (Pl. IV. fig. 3) about 30 mm. long and 20 mm. in width. The other, a fourth premolar (Pl. IV. fig. 2) 45 mm. long and 36 mm. wide, is formed of two separate cusps in front, while the hinder cusps are subdivided each into about four smaller ones, and make a nearer approach to a ridge; the talon is fairly well-marked.

It may be stated at this point that no part of the material in the present collection gives any evidence in support of the genus *Hemimastodon*\*, which was originally described from specimens from the same beds in Baluchistan. Schlesinger† has criticised the validity of this genus somewhat adversely, and has pointed out that, with the exception of the type specimen (a third upper molar), all the other specimens fall within the limits of known variation of *B. angustidens*. The type tooth has only three ridges instead of four, and is of a more pronounced triangular shape than the third molars just described. Schlesinger has made the tentative suggestion that it may be a four-ridged tooth with the front ridge broken away‡, which has been misinterpreted as a complete three-ridged one. This, of course, is possible, and fractured specimens of proboscidian teeth with extraordinarily little evidence of the fractured surface are not rare. On the other hand, the broken edges of these teeth all show a convex anterior border, whereas the presumed line of fracture in the tooth under discussion is decidedly concave. The normal front border of these teeth seems to be convex in unworn specimens, which in fully-developed teeth may become flat or concave by pressure of the tooth in front. If Pilgrim's specimen be an entire one, there remain alternative explanations. Either it is an abnormal specimen, or Pilgrim was correct in making a generic distinction for it and keeping it apart from the genus *Buonolophodon*. In neither case is there any proof for or against his view, except the negative evidence of two seasons' collecting over the same ground, which has produced nothing to confirm the genus *Hemimastodon*, while the more ordinary variations of *Buonolophodon angustidens* occurred in fair quantity.

The right and left fragments of the lower jaw are in precisely the same stage of wear as the older of the two palates, and are in all probability parts of the same animal. The fourth premolar and first molar are well worn, the second has the first two ridges in wear, and a complete third molar lies in the alveolus.

Compared with a specimen in the British Museum, the mandible (text-fig. 2) is not only smaller, but gives the impression of having been considerably shallower than is usual; it compares

\* Pilgrim, *loc. cit.*

† *Loc. cit.* p. 48.

‡ A third lower molar minus the first ridge would give a shape very close to that figured by Pilgrim.

Text-figure 2.

*Buolophodon angustidens*. Lower jaw with third molar in the alveolus.  $\times \frac{1}{2}$ .

more closely with Schlesinger's figure of a specimen\*, a rather older animal, which is named var. *subtapiroidea*, but which is noted as not typical.

The third lower molar of this present specimen agrees, however, neither with those figured by Schlesinger for var. *typica* †, nor for var. *subtapiroidea* †, nor with any of the corresponding teeth of *angustidens* in the British Museum collection or at Cambridge.

On the other hand, there are four specimens of third lower molars in the present collection which agree in a certain point among themselves and also with that described by Lydekker as the type tooth of var. *paleindica*.

There are the usual four ridges and small talonid. Each ridge is formed of two cusps, each cusp being unequally divided into a large outer and small inner one, the two smaller cusps lying towards the middle line of the tooth, and the four cusps which constitute the ridge are arranged in a straight line at right angles to the long axis of the tooth. The only exception to the division of the cusps is that the inner cusp of the fourth ridge is practically undivided. So far these characters approximate to those of *subtapiroidea*; the first and second valleys, however, have each a large cusp standing up separately in unworn specimens from the ridges, but showing in worn specimens as being more connected to the anterior ridge than the posterior; the third valley in this specimen has no cusp visible. This arrangement does not appear to be that of Schlesinger's var. *tapiroidea*. A reference to his figures shows that it should have the valley cusps small or absent ‡ and the main cusps clearly divided, while in var. *typica* the main cusps are less clearly divided and the valley cusps are prominent. There are, moreover, two cusps to each valley, the anterior being derived from the posterior flank of the external cusp of the anterior ridge, and the posterior from the anterior flank of the corresponding cusp of the posterior ridge §.

A specimen of a small form of *typica* from Sansan, in the Cambridge Museum, is figured for comparison with the Indian forms (Pl. III. fig. 1).

Either of these forms can be matched by specimens from the Middle Miocene of France in the British Museum collection. The valley cusps may be large or small, but always show the same tendency to be two in each valley. The Indian specimens all show single cusps in the valleys, large in the first, smaller in the second, and in the third valley may even be absent.

Lydekker || states that var. *paleindica* is separated on account of a "somewhat greater development of the accessory columns."

\* Schlesinger, *loc. cit.* pl. v. figs. 1 & 2.

† *Loc. cit.* pl. viii.

‡ This is best shown in his fig. 1 of plate viii.

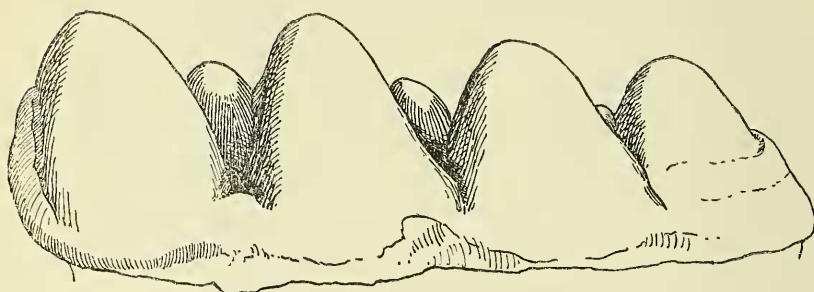
§ This arrangement can clearly be seen in his fig. 4 of plate viii., where a string, used to support the specimen, runs between the two cusps in the second valley of the tooth.

|| *Cat. Foss. Mamm. British Museum*, vol. iv. p. 29.

It is, however, not so much that the cusps are necessarily more developed, as that their comparative isolation from the ridges is the point that strikes the eye. And a greater character is the fact that they are single in each valley. An absolutely unworn third lower molar similar to the tooth in the jaw described above is here figured (Pl. II. fig. 1 and text-fig. 3), but being in better condition, it shows the characters more clearly.

Of European forms in the collection of the British Museum, the nearest approach in general appearance to the Indian teeth is a damaged specimen with the first ridge and front part of the second broken away (Pl. II. fig. 2). The main cusps were probably divided as in the Indian specimen, but the divisions have become obliterated by slight wear. The third ridge shows the presence of the second valley cusp, which is small but enough with the larger anterior one to close the valley. The third valley is similar to the Indian specimen in having only one cusp. The talon of the Indian specimen is very small and consists of

Text-figure 3.



*Bunolophodon angustidens*. Third lower molar in side view.  $\times \frac{3}{4}$ .

two cusps only, and this is rather a feature of the Indian teeth, which have either two or never more than three cusps on this ridge. French forms seem to have three or four cusps as in the specimen figured, while Schlesinger figures\* four molars, two of *subtapiroidea* with two cusps, one of *typica* from France with two, and one of *typica* with three. On the whole, the Indian lower teeth seem to come more under Schlesinger's heading of *typica*, while the upper teeth approach that of *subtapiroidea*†.

A larger and more worn third lower molar (text-fig. 4) is figured which shows a distinct curvature of the lateral borders. This curvature Lydekker has quoted as one of the characters of var. *palaïndica*, but the presence of perfectly straight teeth in these deposits shows that it has no great significance. On the other hand, it shows very clearly that the valley cusps are single.

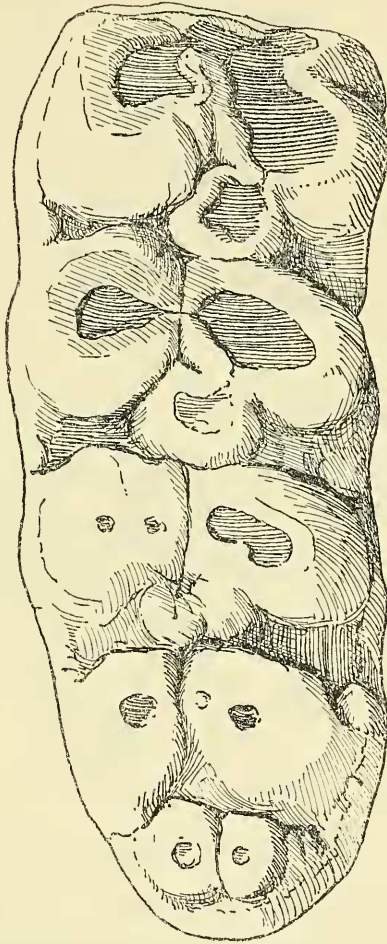
\* Schlesinger, *loc. cit.* pl. viii.

† In one case the upper and lower teeth belong to one individual, which renders his distinction of less value.



It is not unlike Lydekker's figured \* specimen (text-fig. 5), except that in the latter the cusps of the transverse ridges are not straight across, but are bent up in the middle line in the third and

Text-figure 4.



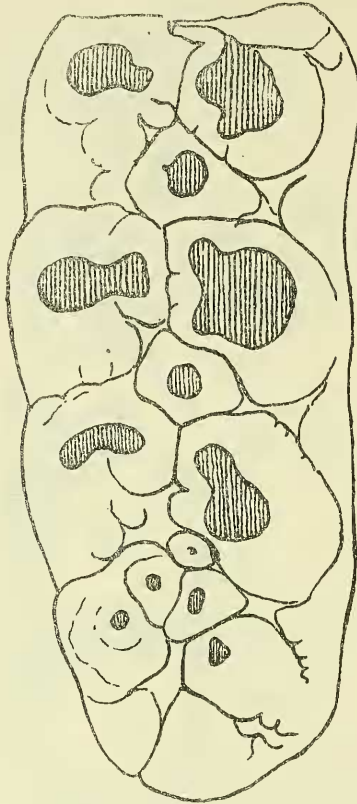
*Bunolophodon angustidors.* Third lower molar.  $\times \frac{3}{4}$ .

especially in the fourth ridges. After making allowance for this, his form can be seen to fall in with the other Indian teeth here described. As this complete singleness of valley cusps does not seem to occur elsewhere, it seems that Lydekker's view that the

\* Mem. Geol. Surv. Ind. vol. iii. pl. 4, fig. 3.

Indian specimens form a separate variety on this character is to some extent justified\*, and has at least as much to commend it, in the present state of our knowledge, as have the varieties

Text-figure 5.



*Bunolophodon angustidens*. Outline of the type-specimen of var. *palæindica*, figured by Lydekker.  $\times \frac{3}{4}$ .

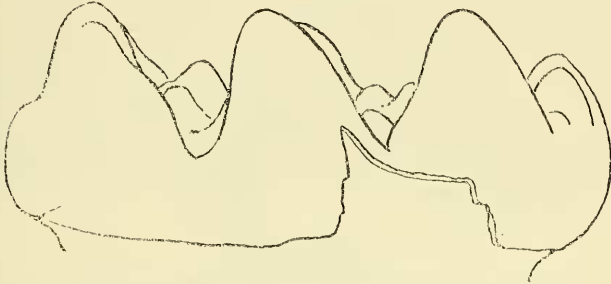
*typica* and *subtapiroidea*, which appear to have intermediate stages between them.

“Species” and “subspecies” have little significance in palæon-

\* A close approach, however, to the Indian teeth is figured by Wegner (*Palæontographica*, vol. lx, 1913, pl. xv, figs. 3 & 4). This specimen is more advanced in its larger talon, and has a number of accessory cusps in the first valley. The second and third valleys, however, are like the Indian form except that the cusps of the fourth ridge are fully divided into two each. Wegner's specimens, an upper as well as a lower molar, come from the Upper Miocene of Doppeln, and though more advanced than the Indian form, are constructed on somewhat the same plan. Wegner notices the same difference between his forms and specimens from Sansan as is noticed here.

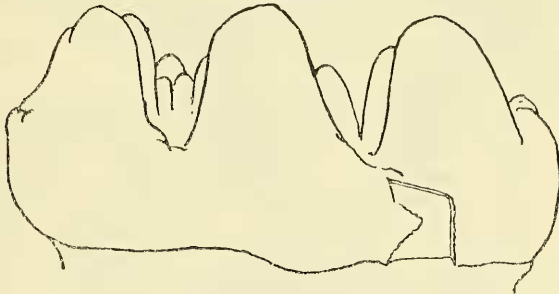
tology except for descriptive purposes, and as other material becomes available from new sources, all these distinctions will be merged in the mass of small variations from which new mutations will eventually arise. Moreover, but few specimens of *angustidens* have, as yet, been obtained from India, and additional material is required to show whether the differences here noted are constant or not.

Text-figure 6.

*Bunolophodon angustidens*. First lower molar in side view.  $\times 1$ .

Of the other lower teeth, the second molar is rather different from a French specimen from Simorre (B.M. No. 42720) in being longer and narrower in proportion, in the more widely open valleys, and in the greater prominence of the talonid ridge, where the two cusps stand up very prominently (text-fig. 2). Of first lower molars there are several specimens, one of them (text-fig. 6 and

Text-figure 7.

*Bunolophodon angustidens*. First lower molar (B.M. No. 29671) from Simorre, in side view.  $\times 1$ .

Pl. IV. fig. 1) absolutely unworn. Compared with two specimens (text-fig. 7), also unworn, from Sansan and Simorre respectively, the Indian tooth is rather longer for its breadth and is widest at the last ridge; the valleys, as in the other lower molars, are less blocked by the accessory cusps. The talonid is formed of two

well-marked cusps, a feature of all the Indian teeth, whereas of the European forms here compared, one has three cusps and the other a low ridge of eight or nine wrinkles. The valleys are more open and the ridges lower. The accessory cusps in the second valley are much lower.

There remain for a brief notice several ends of lower teeth, apparently third molars, which are of unusual form. They all resemble the one figured (Pl. III. fig. 2) in the buckling up of the last ridge and in the curious structure of the talonid, which is formed of four cusps of different sizes pressed together into a conical hillock. The valley between the last ridge and the talonid is widely open and without any accessory cusp. This condition I have not been able to match at all closely, although some specimens of *B. longirostre* approach it. The teeth are the average size of *B. angustidens*. Whether they represent another form or are within the range of variation of the latter species cannot at present be told.

#### DINOTHERIUM.

This genus was first described from India by Falconer\*, who named a specimen from Perim *D. indicum*. Its specific characters, according to him, lie in the shape of the jaw, there being no difference from *D. giganteum* in the teeth except a greater thickness of the enamel.

A second form, smaller than the first, from Attock was mentioned, but not definitely named by him. This was subsequently called *D. pentapotamia* by Lydekker †. In the Catalogue of Fossil Mammalia in the British Museum ‡, presumably his final opinion on the subject, he included the two forms under the name *indicum*, and stated that many of the differences previously used by him had proved to be individual variations.

Another "species," *D. sindiense* (Lydekker), is too fragmentary to afford any evidence of a specific character.

More recently Pilgrim has mentioned this genus. In the Records § of the Indian Geological Survey he names a form from Baluchistan *D. naricum*, there stating that "it differs very markedly from the other known species," and giving certain characters. In his Memoir ||, however, he withdrew this name and made the form a variety, *gajense* of *D. pentapotamia*, although Lydekker had already shown cause for making the latter the same as *D. indicum*.

Presumably Pilgrim's reasons for making his form a variety were those by which he was at first inclined to make it a species, i.e. the fact of the ridges in the last lower molar not being parallel

\* Falconer's Memoirs, vol. i. p. 408.

† Pal. Ind. ser. x. vol. i. pt. 2, p. 72, pl. ix.

‡ Pt. iv. p. 11, and footnote.

§ Pilgrim, Rec. Geol. Surv. Ind. vol. xxxvii. p. 156 (not vol. xxxviii. as quoted by Pilgrim in his Memoir).

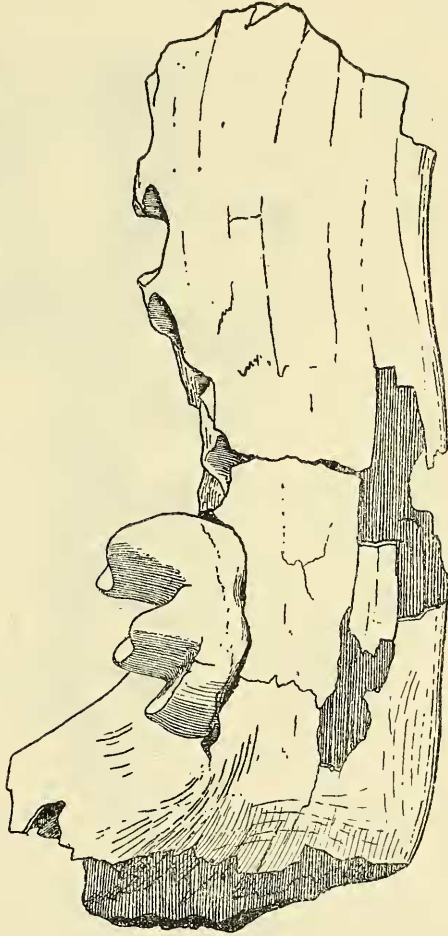
|| Pilgrim, Mem. Geol. Surv. Ind., n. s. vol. iv. no 2 (1912).

to one another, but diverging from within outwards, etc. In the same paper he gives characters in which he considers the Indian forms differ from *D. giganteum*. These are:—

1. The longitudinal ridge connecting the transverse crests in the molars is very much stronger in the Indian forms.

The present writer is unable to see this difference in specimens in the present collection, nor can the published figures

Text-figure 8.



*Dinotherium* sp. Lower jaw of left side in side view.  $\times \frac{1}{4}$ .

of Indian forms be said to show any great difference in this respect from European specimens in the British Museum collection.

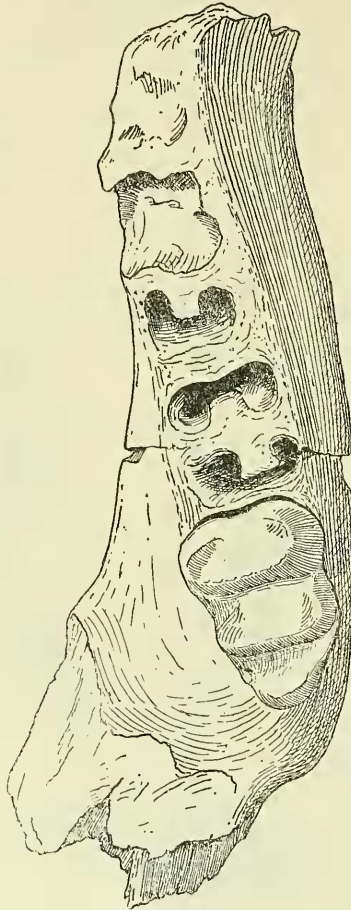


2. The transverse valley in the second upper molar is completely blocked on the inner side, and

3. The inner posterior column of the third upper premolar is more isolated than in *giganteum*, in which a ridge in continuation of this column extends right across the valley.

These two characters seem to be within the limits of variation of European forms. A third upper premolar from Darmstadt (B.M. collection, No. M. 3494) has the column quite isolated.

Text-figure 9.



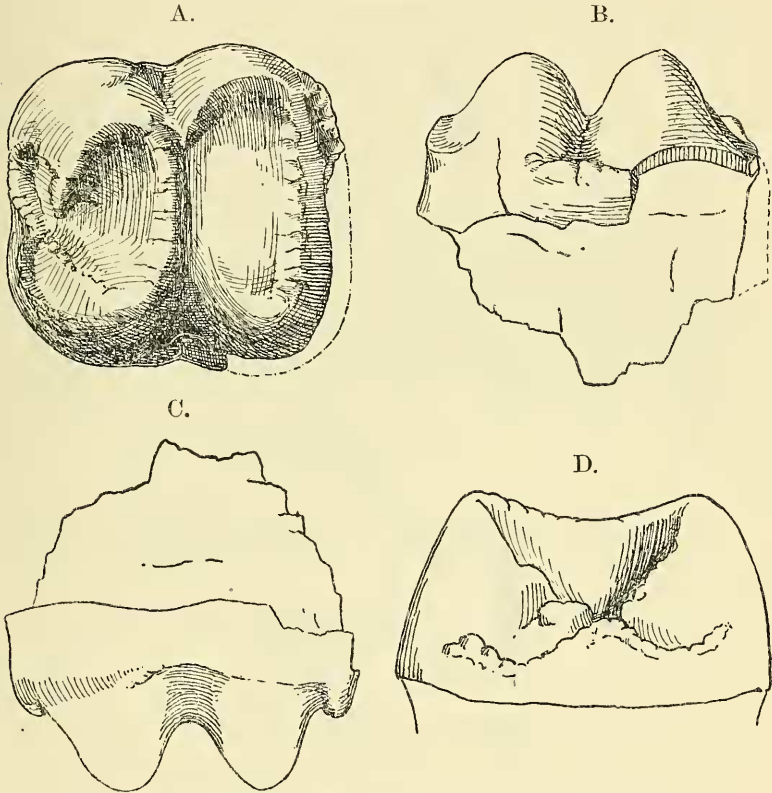
*Dinotherium* sp. Lower jaw of left side in surface view.  $\times \frac{1}{3}$ .

The material of the present collection from the Bugti beds is, as is the common experience, both scanty and fragmentary, and consists only of part of a lower jaw and some separate upper and lower teeth. The lower jaw (text-figs. 8 & 9) belongs to a small

form, and in size and structure compares closely with *D. hobleiyi* \*. The third ridge of the last molar is not parallel to the front ones, but slopes at an angle similar to that found in *D. hobleiyi* and *D. levius*.

Of the separate teeth, none shows any great difference from specimens of European forms with which it has been compared. An upper molar, probably a second, is here figured (text-fig. 10).

Text-figure 10.



*Dinotherium* sp. Second upper molar. A. Surface view. B. View from inner side. C. External side. D. Posterior view.  $\times \frac{3}{4}$ .

There is nothing in it which can be construed as a "longitudinal ridge," nor is there anything in the nature of a "cusp blocking the valley" which has not been found within the range of variation of European specimens. A third upper premolar (Pl. IV. fig. 6) is also figured to show the separation of the inner cusps said to be characteristic of the Indian forms,

\* Andrews, P. Z. S. 1911.

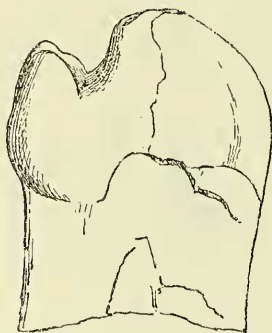
but which, as has just been stated above, occurs also in *D. giganteum*. The remaining teeth in the collection are not distinguishable from the smaller forms from Europe, and call for no comment except for three specimens. Of these, one appears to be an anterior lower milk molar (Pl. IV. fig. 4 and text-fig. 11), a tooth which apparently has not so far been noticed. It is 24 mm. long and 21 wide, and consists of two ridges, one running from the middle of the inside border round the front and along

Text-figure 11.

*Dinotherium* sp. Anterior lower milk molar, internal view from side.  $\times 1$ .

the whole outside border, but being interrupted by a small notch towards the front of the outer border; the second ridge runs transversely across the hinder part of the tooth from a high cusp on the inner side towards the outer border. The tooth is pointed in front, wide behind, and triangular in ground-plan. Posteriorly there is a small cingulum shelf and anteriorly a small cingulum cusp.

Text-figure 12.

*Sp. incertae sedis*. Side view of tooth, the anterior end pointing to the right.  $\times 1$ .

The next tooth (Pl. IV. fig. 5) is apparently a third upper premolar, but of unusual form. It is partially worn, and shows on one side two low cusps not touched by wear; opposite these are two large irregular areas of wear. There is no cingulum around these cusps, but a small one at each "end" of the tooth. In the plate the two low cusps are placed in the same position as the ectoloph of the more normal premolar (broken in this speci-



collection of the British Museum without result\*. It is certain that it does not belong to any known form of *Dinotherium*, and yet it is to teeth of that genus alone that it can be compared.

#### SUMMARY.

The Proboscida of the Bugti beds of Baluchistan consist of a form of *Bunolophodon angustidens* and a small *Dinotherium*.

The Indian *B. angustidens* is of a small type more primitive than the French forms from Sansan, nearer to Schlesinger's form *subtapiroidea* than his form *typica*, but not identical with it. Lydekker's subspecific name var. *paleindica* may be retained for the present until intermediate forms are found to occur. The genus *Hemimastodon* is not supported by material in the collection.

The *Dinotherium* is not found to differ from the smaller European forms nor from *D. hobleyi* of Africa, and it is doubtful in the present state of knowledge whether the Indian Dinotheres are separable from the European.

#### EXPLANATION OF THE PLATES.

##### PLATE I.

- Fig. 1. *Bunolophodon angustidens*. Third upper molar.  
 2. " " Second upper molar.  
 Both figures are reproduced about  $\frac{3}{4}$  natural size.

##### PLATE II.

- Fig. 1. *Bunolophodon angustidens*. Third lower molar.  
 2. " " Incomplete specimen from Sansan. (B.M. No. 32533.)  
 Both figures are reproduced about  $\frac{3}{4}$  natural size.

##### PLATE III.

- Fig. 1. *Bunolophodon angustidens*. Third lower molar from Sansan. (Cambridge.)  
 2. " " (*angustidens*?). Terminal part of a third lower molar.  
 Both figures are reproduced about  $\frac{3}{4}$  natural size.

##### PLATE IV.

- Fig. 1. *Bunolophodon angustidens*. Unworn first lower molar.  
 2. " " Fourth upper premolar.  
 3. " " Third upper premolar.  
 4. *Dinotherium* sp. Anterior milk molar.  
 5. " " Third upper premolar.  
 6. " " ? Third upper premolar of unusual type.  
 7. *Sp. incertæ sedis*. ? An anterior premolar.  
 All figures are reproduced a shade under natural size.

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\* Such as *Listriodon* etc. India has produced animals with very unusual dentitions such as *Tetraconodon*; the present specimen may belong to yet another strange form.